

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 1-6, 8, 9, 12-17, 21-26, and 28-35 are pending in the present application.

In the outstanding Office Action, Claims 1-3, 5, 9, 16, 17 and 28-30 were rejected under 35 U.S.C.103(a) as being unpatentable over Leung et al.(U.S. Patent No. 6,653,718, hereinafter Leung) in view of Brewer et al. (U.S. Patent No. 6,322,600, hereinafter Brewer); Claims 4, 6 and 26 were rejected under 35U.S.C.103(a) as being unpatentable over Leung in view of Brewer, and further in view of Gu et al. (U.S. Patent No. 6,551,901, hereinafter Gu); Claims 8, 12-15, 21-25, 31, 33 and 35 were allowed; and Claims 32 and 34 were objected for depending from rejected base claims, but were indicated as including allowable subject matter.

Applicants thank the Examiner for the allowance of Claims 8, 12-15, 21-25, 31, 33 and 35, and the indication of allowable subject matter in Claims 32 and 34. However, Claim 9 depends from allowed Claim 8, and Claim 29 depends from Claim 9. Therefore, Claims 9 and 29 should be allowed.

Claim 1 is directed toward a semiconductor device that includes: a semiconductor substrate with a trench, a particulate isolating layer filling at least a lower portion of the trench and comprising insulating particles, wherein an average diameter of the insulating particles falls within a range of 100 nm to 500 nm or a range of 100 nm to half a width of opening of the trench; and a reflowable dielectric layer covering an upper surface of the particulate insulating layer, the insulating particles being stable at a melting point or a softening point of the reflowable dielectric.

With respect to the rejection of Claim 1 as unpatentable over Leung and Brewer, Applicants respectfully traverse this ground of rejection. Claim 1 recites *inter alia*,

“wherein an average diameter of the insulating particles falls within a range of 100 nm to 500 nm or a range of 100 nm to half a width of opening of the trench.” Leung and Brewer do not describe or suggest at least this element of Claim 1.

The outstanding Office Action states, on page 3, lines 12 to 18,

Leung et al. fails to disclose the required diameter size for the insulating particles. However, Brewer et al. disclose planarization composition where in the abstract section the required diameter size for the insulating particles are disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required insulating particles size in Leung et al. as taught by Brewer et al. in order to have a semiconductor device with bettering insulation characteristics.

The outstanding Office Action also states, on page 5, line 17 to page 6, line 5,

Leung does not disclose the device with the required insulating particles with the required average diameter further comprising a cap insulating layer covering an upper surface of the reflowable dielectric layer. However, Brewer et al. disclose planarization compositions where in the abstract section the required dielectric particles with the required average diameter size are disclosed.

The planarization composition of Brewer is a chemical mechanical planarization (CMP) slurry as is apparent from, for example, the description in column 6, lines 13 to 31 of Brewer. An average diameter of particles contained in CMP slurry is irrelevant to an average diameter of particles as a constituent of a semiconductor device. For this reason, it is impossible to incorporate the average diameter of the insulating particles taught by Brewer into the semiconductor device of Leung.

Furthermore, Applicants respectfully submit that Gu does not cure the above-noted deficiencies in Leung and Brewer.

In view of the above-noted distinction, Applicants respectfully submit that Claim 1 (and Claims 2-6 dependent thereon) patentably distinguish over Leung, Brewer, and Gu, taken alone or in proper combination. Applicants respectfully submit that Claim 16 is similar to Claim 1. Thus, Applicants respectfully submit that Claim 16 (and Claims 17 and 30 dependent thereon) patentably distinguish over Leung, Brewer, and Gu, taken alone or in proper combination, for at least the reasons stated for Claim 1.

Consequently, in light of the above discussion, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



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Eckhard H. Kuesters  
Attorney of Record  
Registration No. 28,870

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

Joseph Wrkich  
Registration No. 53,796